THESIS

ON

THE CLINICAL ASPECTS

OF

A P P E N D I C I T I S

BY

DAVID HAITLY BURN, M.B., C.M.

CITY ROAD,

B I R M I N G H A M.

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"Under the barbarous name of APPENDICITIS", I include Typhlitis, Perityphlitis and Paratyphlitis, because pathological statistics have proved that in the majority of cases the diseases described under these terms have taken origin in the appendix and where this is not the case the clinical features of the diseases are altered by the cause.

Tubercular, Dysenteric, Enteric or Cancerous ulceration of the caecum may produce Typhlitis, Perityphlitis or Paratyphlitis, but clinically the symptoms will be combined with those of the cause and a true picture of what has been described under these names is most usually obtained when the inflammation has begun in the appendix caeci.

The number of varities of Appendicitis varies according to the classification and while from a pathological point of view three varieties, Simple Appendicitis (Acute and Chronic), Suppurative and Gangrenous may suffice, clinically it is convenient to have more, as we must class as Appendicitis some cases in which there is probably no pathological change whatever.

It is customary to first describe the functional diseases of an organ as they are least important and recovered from.

APPENDICULAR COLIC is the term applied by Talamon[I] to what is probably only irregular muscular contractions of the appendix. If any pathological condition exists it is merely a slight catarrh of the mucous membrane.

The following is an example:

Case I. J. H. age 21 years, a hairdresser who has always enjoyed good health, but has been troubled with constipation recently. On February 12th 1896, he began to have pains in the bowels about 11 A.M. These he attributed to having eaten two raw apples two hours previously. The pains, of a paroxysmal colicky type continued during the day and about 5 P.M. he felt chilly and sick. During the night he vomited frequently, and when first seen on the 13th of February complained of pain all over the abdomen, but more marked over the appendix. A dose of castor oil had been administered in the early morning, and the vomiting which was of a bilious nature had now ceased. There was marked tenderness over the appendix, the temperature was normal, the pulse 72, and respirations 20 per minute.

On the 14th February he felt better and suffered no pain, though there was some tenderness over the appendix. There was no dullness on percussion, the temperature was 98'4 Fahrenheit, and the pulse 72 per minute.

On the 15th February the tenderness over the ap-

pendix was less marked, and the temperature and pulse were then normal.

On the 17th there was no tenderness to be elicited. The bowels were opened and the patient wished to get up.

On the 20th, eight days from the commencement of the illness, the patient was allowed out of bed.

The treatment consisted of a milk diet and rest in bed; no drugs being given, except the one dose of castor oil.

The main symptoms are the sudden onset of acute pain in the right iliac fossa with paroxysmal exacerbations radiating over the whole abdomen like intestinal colic; with vomiting and usually constipation.

These cases I believe to be very common, though not so often brought under the notice of the practitioner as they generally yield to domestic remedies, such as castor oil, with, or without laudanum, and are commonly looked upon as cases of intestinal colic Like intestinal, biliary or renal colic they may be due to the presence of some hard substance passing into or out of the muscular canal or lying in it and irritating its mucous membrane. Foreign bod ies, such as hard particles of nuts, fruit stones, or more frequently hardened faeces, will produce the symptoms by being forced into the appendix or out of it, and it is only when the irritation has lasted

sufficiently long to produce catarrh of the mucous membrane and a reflex paresis of the gut that the practitioner is called in at all, "because he cannot get his bowels moved".

The vast majority of cases of Appendicitis begin with the symptoms of appendicular colic, as the majority are due directly or indirectly to irritation of the appendix.

If the symptoms do not subside in ten or twelve hours we have the more marked symptoms of ACUTE APPENDICITIS of which Cases II and III may be taken as examples.

Case II. A.H., aged 34, a plumber, who has always been healthy, but whose family history is tubercular, His mother and one sister having died of phthisis. Except for the treatment of an injury to the left hand he had not required to consult a doctor since childhood.

On August 1st 1895, at 5 A.M., he sent for a draught to ease pain in the bowels and to ask me to call during the day. I sent a draught containing half a drachm of chlorodyne. At 11 A.M., when first seen, he complained of severe colicky pains all over the bowels. The pain began at 10 o'clock the previous evening after eating a hearty supper, roasted cheese being included in the menu. The pain was most marked round the umbilicus and he vomited three times during the

night. At 3. A. M. and again at 5. A.M., he had a loose motion of the bowels, but previous to that had been constipated for three days. The temperature was normal, the pulse 70, the abdomen was resonant, not tender to touch, and the paroxysmal pains were to a certain extent relieved by pressure. Six drachms of castor oil with ten minims of laudanum were ordered, and the bowels were moved twice during the day. In the evening the pain was still the same, but there was no sickness and the temperature and pulse remained normal.

On the morning of the 2nd, the temperature was 98'8, the pulse 70. There was no sickness, but periodic attacks of pain referred to umbilical region. The abdomen was somewhat distended, and there was some tenderness and increased resistance over the right iliac fossa, but no dullness. In the evening the pulse was 70, and the temperature 100 Fah. Pills containing half a grain of opium were ordered to be given every four hours, poultices to the abdomen, rest in bed, and a milk diet.

On the 3rd, a distinct tumour could be made out in the right iliac fossa about four inches long and two and a half in breadth. On percussion it was resonant and very tender. The colic pains had ceased, the temperature was normal and the pulse 65. In the evening the temperature was 98'8 and

the pulse 70 per minute.

For the next three days the tumour remained about the same size, was tender to touch, and relatively dull on percussion. The bowels were moved by enemata every second day after the fourth. On the evening of the sixth, the tumour began to disappear, and by the tenth was completely gone. The pulse and temperature remained normal after the third day. The tongue which was coated with a thick fur at first gradually cleaned and the patient was able to be up on the fourteenth day.

Case III. A.W., aged 24, a bricklayer's labourer came on July 7th, 1895, complaining of pain in the right iliac fossa and constipation. Three days previously he had an attack of sickness and "spasms" in the bowels. The bowels were moved once then but had not been opened since. There was an area of dullness over the appendix, the temperature and pulse were normal, the tongue coated with a thick fur of a yellowish-white colour. The patient was sent to bed and put on milk diet. The bowels were moved every day for a week by enemata. The dullness slowly diminished and disappeared after 10 days. The pulse and temperature remained normal throughout. Tenderness over the appendix remained for a week after the disappearance of the dullness.

These cases are characterized by persistent pain now more localised to the right iliac fossa, ~~and~~ with or without the presence of a tumour in that region. The inflammation starting in the mucous membrane spreads through the different layers to the peritoneum, recovery taking place by lysis.

But recovery may not take place and the inflammation may pass on to suppuration, forming a localised abscess.

The following case is an example of APPENDICITIS with LOCALISED ABSCESS.

Case IV. A.T., a strong healthy girl, 15 yrs. of age who began work in a brass chain factory a week before, was first seen on Saturday 2nd Nov. 1895. On the previous Wednesday after returning from work she had an attack of shivering with sickness, vomiting and diarrhoea. Next morning the sickness and diarrhoea had ceased but she had some pain in the bowels and kept in bed during the day. On the following morning she felt better and got up but had to go to bed again. No solid food was taken, but a couple of pills which produced two evacuations of the bowels causing her a considerable amount of pain, limited to the right iliac region, where a lump was felt. On the fourth day of illness when first seen the temperature was 100'2 Fah. and the pulse 100. The abdomen was tympanitic

except in the right iliac fossa where a tunour could be distinctly felt. It was dull on percussion, very tender to touch about two inches in breadth and extended from the right iliac fossa upwards to about an inch above the level of the anterior superior iliac spines.

Menstruation had always been regular, the period began that morning and to this the illness was ascribed.

Patient was ordered to be kept in bed, on a milk diet and to have poultices applied over the tumour. On the fifth day she felt better, the temperature was 99'8 Fah. and the pulse 78. The abdomen was more tense and the area of dullness slightly increased. On the sixth day the temperature was 98'6 Fah. and the pulse 80; there was less tenderness over the tumour but the area of dullness was the same as on the previous day.

On the seventh, eighth and ninth days the temperature remained normal both morning and evening, but the pulse varied between 75 and 90 beats per minute. The tumour remained the same but the tenderness was less marked. The bowels were open on the 8th day without causing any pain.

On the 10th day menstruation ceased; the temperature was 99'5 in the morning and 101 in the evening, the pulse rate being 96 both morning and evening. During the day an urticaria-like rash

came out over the chest and abdomen and she complained of headache. On the 11th day the tunour had undergone a rapid increase in size and now extended to within an inch of the level of the umbilicus and laterally almost to the middle line. The rash had extended to the thighs and the arms and extensor aspects of the forearms. She felt well and complained of no pain except the tenderness over the swelling. She had no pain or difficulty in micturition. The temperature in the morning was 99 Fah. and in the evening 100'2 Fah., the pulse rate being 100 on both occasions.
On the twelfth, thirteenth and fourteenth days the size of the tumour remained stationary. The temperature varied from 99 Fah. to 101 Fah. and was a degree or a degree and a half higher in the evening than in the morning, the pulse rate gradually increasing from 100 to 120. On the 14th she complained of pain in the back over an area corresponding to the area of dullness in front. No rigor took place but a diagnosis of pus formation was made.

From the fourteenth to the seventeenth day the temperature varied between 101 Fah. and 102 Fah., the pulse was 120 regular and of good volume.
The tongue was moist and coated with a white fur.
The appearance of the patient did not suggest any serious illness.

On the seventeenth day of the disease she was anaesthetised with chloroform, the skin purified and after ascertaining that the bladder was empty the operation commenced.

An incision about three inches long was made over the tumour, obliquely downwards and inwards, about an inch and a half internal to the anterior superior iliac spine and terminating external to the deep epigastric artery. After cutting through the aponeurosis of the external oblique the muscular fibres of the deeper muscles were separated with as little injury as possible. The parietal peritoneum was not adherent to the tumour and the general peritoneal cavity was entered. Swabs were packed round the inside of the wound to prevent as much as possible fouling of the peritoneum, and on separating the adhesions between the caecum and small intestine, about two ounces of pus were evacuated, and quickly mopped out, the patient being turned on her right side. The appendix was felt behind the caecum, The abscess cavity was stuffed with iodoform gauze and the wound in the abdominal wall partially brought together by three sutures of silkworm gut.

On coming out of chloroform 5 grains of calomel were administered and an effervescing saline draught two hours afterwards. The draught was vomited, so an enema of warm water and soap with a teaspoonful of turpentine added, was administered.

This produced two free evacuations of the bowels. On the following day the wound was dressed, there was no distension of the abdomen, which was soft. The patient felt fairly well and was allowed to take some milk by the mouth. On the 3rd day after the operation the bowels were moved without the use of an enema or an aperient. The temperature came down to normal and the pulse to 85.

From the 3rd day after the operation the progress towards recovery was uninterrupted, the patient being up on the 24th day. No rash appeared after the operation and there was no tendency to constipation.

Closely allied to this class of case are cases in which the appendix ruptures as the result of distention with fluid or a concretion injuring the integrity of the mucous membrane. At any time in the course of a simple Appendicitis the localised peritonitis may be thus transformed into a localised abscess.

In these cases the symptoms are more acute than in the slow formation of pus in the peritoneal adhesions without rupture.

The following will serve as an illustration of this form of PERFORATIVE APPENDICITIS with LOCALISED ABSCESS.

Case V. E.B., a strong healthy school-girl, 16 years of age, who had never menstruated. She

was fond of gymnastic exercise and always enjoyed good health except for headaches due to astigmatism which is now corrected by glasses.

On Tuesday, 10th December, she was upset by the news that a friend had been accidently shot. As a result she could not take her food and the bowels became constipated, a very rare condition with her. She felt some slight pain in the bowels but went to school as usual on the Wednesday and Thursday. On the latter day the pain in the bowels became so severe that she returned home at 12 o'clock. She complained of sickness and a general feeling of malaise with pains all over the abdomen but greater in the right iliac region. She vomited twice and after the sickness the pain in the epigastric region disappeared. A seidlitz powder was given and poultices applied to the bowels. On the 13th Dec., when first seen the patient was lying on her back with the thighs flexed. There had been constipation for two days and the seidlitz powder given the previous evening had produced no effect on the bowels. The temperature was 101 Fah. and the pulse 120 per minute. The abdomen was resonant all over but tender over the region of the appendix. She felt sick but was not vomiting.

She was ordered to have the bowels opened by enemata, to rest in bed, have a milk diet, and half a grain of opium every 6 hours.

In the evening the patient felt better, but the temperature was 102 Fah. and the pulse 140. The tongue was dry, coated and slightly brownish. There was a feeling of resistance in the right iliac region but no dullness, though very tender, the tenderness being most marked in a very limited area over Mc.Burhey's point.

She was flushed and perspiring, lying on her back with the legs drawn up. She complained of pain during micturition and frequent calls to micturate.

On the morning of the 14th Dec., the temperature was 101 Fah. and the pulse 120. The tenderness over the appendix was extreme and the note on percussion impaired. The tongue was dry and browner than on the previous evening and the pain constant. The abdomen was somewhat swollen generally. Three leeches were applied over the tender area and relieved the pain greatly. In the evening the temperature was 102 Fah. and the pulse 130. There was distinct dullness in the right iliac fossa extending from about an inch above the level of the anterior superior iliac spine obliquely downwards to about the middle of Poupart's ligament on the left side. The tongue was dry and brown and the patient had a dusky appearance.

On the morning of Dec.15th the temperature was 102 Fah. and the pulse 120. The patient com-

plained of little pain but the dullness extended right across the lower part of the abdomen as high as the level of the umbilicus. The patient's face was of a dusky hue, the lips livid and dark lines round the eyes gave prominence to the eyeballs and a sharpness to the nose.

She was put under chloroform, the skin purified and the bladder emptied, 30 oz. of urine being drawn off.

The dullness was now distinctly limited to the appendicular region where a tumour was distinctly visible. An incision about three inches long was made over the most prominent part obliquely downwards and inwards through skin and fascia. The sheath of the rectus was opened and the muscular fibres turned inwards, the dissection being made carefully down to the peritoneum. The bowels were matted together and adherent to the parietal peritoneum. On carefully separating the adhesion between the coils of gut, about 2 oz. of foetid pus were evacuated. A faecal concretion about the size of a pea was found in the pus. An india-rubber drainage tube was inserted and the wound partially brought together by one silk suture.

In the evening the temperature was 101 and the pulse 120 but the appearance of the patient had much improved.

Next day the temperature was 98'4 Fah. in the

morning rising in the evening to 100 Fah. The morning pulse was 90 and the evening 100. During the night the patient slept for about an hour and the bowels moved. In the evening the wound was dressed, there being very little discharge. She was ordered beef tea and peptonised milk alternately every 2 hours.

On the 2nd day after the operation the temperature in the morning was 98'6 Fah. and in the evening 99' Fah., the pulse was 80. This condition remained for the next seven days when the pulse came down to 72. The bowels were moved daily by glycerine injections. On the 2nd day after the operation a rash broke out all over the body. In appearance it was like a mixture of sudamina and urticaria. The itching was intense, but was relieved by using a dusting powder of zinc oxide, boric acid, and starch. On the 4th day the rash on the arms and chest was more like a measles exanthem and itched intensely, but did nor prevent her from sleeping. On the 6th day the rash had entirely disappeared. On the 8th day a smaller drainage tube was inserted and four days later this was dispensed with. On the 28th Jan.1896 the wound having been healed for a week, the patient was allowed to get up, the convalescence having been uninterrupted. No tumour or thickening could be made out and there was no tenderness on deep palpation. ----------

In these cases with pus formation the suppuration may extend to the whole peritoneum and a general septic peritonitis be present when the patient is first seen.

The following two cases will serve as illustrations of APPENDICITIS with GENERAL SEPTIC PERITONITIS.

Case VI. E.C., a slimly built delicate girl with a tubercular family history was first seen at 10 P.M. on the 8th of August 1895.

Three days before she complained of pain in the lower part of the abdomen and was given castor oil in repeated and increasing doses and then epsom salts without effect. The child was going about but the constipation not yielding to the drugs given I was called in to relieve it. The temperature was 99 Fah. and the pulse 120. There was slight general distension of the abdomen which was dull to percussion from about an inch below the level of the umbilicus. An enema brought away a pea-soup stool. During the night hot poultices were applied the child vomited once, the vomit being of a bilious character. Next day the whole abdomen was more or less dull but there was no special tenderness. The temperature morning and evening was 99 Fah. and the pulse 120. On the following day the patient complained of no pain and said she felt better. The abdomen was hard, tense and dull on percussion,

the temperature 98, pulse 140. The patient had a pinched and cyanotic appearance and the hands were red and cold.

Permission to operate was granted in the afternoon and a median laparotomy performed. The intestines were all matted together by adhesions. On breaking through these serous fluid escaped from the loculi around the umbilicus, towards the pubes the loculi contained creamy pus and towards the right they contained a curdy pus with a very faecal odour. A counter opening was made over the right iliac fossa and the appendix was found to have been the seat of chronic inflammatory thickening. The peritoneal cavity was washed out and a drainage tube inserted at each incision, but the patient gradually sank and died at 11 P.M..

There was no history of chronic appendicitis.

Case VII. F.H., six years of age, only surviving child of a family of six, the others dying in infancy except one son who died of phthisis at the age of 18 years. She was first seen on the 28th Nov. 1895. When six weeks old she was paralysed in both arms and legs, but gradually recovered For eight or nine months she had progressive paralysis of the left leg and latterly had been walking with the heel drawn up. Tenotomy was performed in hospital on the tendo Achilles on November 12th. She would have been discharged from hospital on

the 23rd but was detained as she had been ill and delirious during the night. She was better on the 24th and was discharged from hospital next day. On the way home she complained of pain in the right iliac region. On the 26th she had a constant desire to stool and was given a teaspoonful of castor oil. This was repeated on the 27th and resulted in the passage of two hard masses of faeces described as being about 3 inches long and as thick as my wrist. She then complained of feeling tired, two loose motions followed soon afterwards and she began to be sick and continued vomiting frequently till seen on the afternoon of the 28th Nov. The temperature was 104 Fah. and the pulse feeble and too rapid to count accurately. She complained of pain in the region of the appendix. There was a markedly tender area of dullness extending from the right iliac fossa upwards to the level of the umbilicus and laterally to within an inch of the middle line. The patient was delirious, the face dusky and the expression anxious. As the patients objected to operation four leeches were applied over the tumour. In the evening she was in the same condition, but had less pain. The dullness had extended to the left iliac fossa.

On the following morning she was not delirious, but the temperature was still 104 Fah. and the pulse could not be counted. Operative interference was strongly urged but declined. In the evening

the pulse was 150 and the temperature 103 Fah. By poulticing the pit of the stomach the sickness was controlled and milk and brandy were retained. The dullness extended above the level of the umbilicus on both sides but was highest on the right. The abdomen was firm but not much distended. Patient had been passing very little water but a pint was passed during the afternoon. She complained of no pain but was very restless. On the 30th the temperature was still 100 Fah. in the morning and the pulse 156. The dullness had extended still higher in the abdomen which was more distended than on the previous day. In the evening the temperature was 99 Fah. and the pulse over 150. The general appearance of the patient was improved but the hands were cold. She died at 10.15 next morning after tossing about for an hour in a restless delirium.

Next we class the most fatal variety, that of ACUTE PERFORATIVE or GANGRENOUS APPENDICITIS, in which there is no localised peritonitis to begin with; the symptoms are very acute and there is a general purulent peritonitis without adhesions practically from the first.

As a student my first acquaintance with the disease was in a case of this kind. The patient, a student, was playing football on the Friday afternoon, was admitted to the students' ward on Satur-

day and on the Sunday after a consultation with one of the physicians, the surgeon opened the peritoneal cavity and found the coils of intestines bathed in pus. The appendix was detached and lying on the posterior wall of the abdominal cavity. The patient succumbed about ten hours after the operation. This case was the total clinical experience I had of Appendicitis as an undergraduate and in seeing it I was privileged by being instrument clerk to the surgeon.

The following is a similar case.

Case VIII. H.H., 8 years of age, was brought to me on the evening of Sunday Nov.3rd /95. He was at school on Friday afternoon and during drill complained of pain in the bowels which continued during the evening and was accompanied by sickness. The bowels were moved early next morning and since then he had been vomiting almost continuously and complained of thirst. He had been more or less subject to constipation for about a year. The abdomen was large, tympanitic and soft; the abdominal parietes thin. The temperature was 98'4 Fah. and the pulse 120, and very feeble. He was ordered rest in bed, soap and water enemata to move the bowels and a mixture of bismuth and hydrocyanic acid. The bowels were moved at 6 o'clock on the following morning, the temperature was 99'2 Fah. and the pulse 104. There was no pain in the abdomen even on pressure. In the evening the

temperature was 99 Fah. the pulse 100 and the patient was delirious. The tongue was dry and covered with a brown fur, the face pinched and the expression anxious. Brandy and milk were retained. On the 5th both morning and evening temperature was 99'4 Fah. and the pulse 90. The abdomen was soft and typanitic and the patient felt well, but the facial expression was very anxious, and in the evening he was very delirious. On the 6th the condition remained the same, the bowels not having been opened since early on the 4th. The patient was chloroformed and a diagnostic incision made in the middle line. Generalised suppurative peritonitis was found, the peritoneal cavity washed out and two drainage tubes inserted. The child died of exhaustion 22 hours after the operation. On post-mortem examination a large perforation was found at the extremity of the appendix, the lumen of which was abnormally patent.

The variety known as RELAPSING APPENDICITIS includes cases of all the varieties except the gangrenous appendicitis in which the disease is rapidly fatal or the patient recovers after the appendix is removed by operation.

Cases IX and X illustrate this type of the disease.

Case IX. This is the same patient as Case V. On Feb.1st 1896, the fifth day after get-

ting up, she felt pain in the region of the cicatrix. She went to bed in the afternoon and when seen in the evening the abdomen was somewhat distended and there was some tenderness in the right iliac fossa. The pulse was 80 and the temperature normal. A draught containing 10 minims of chlorodyne was given. On the morning of the 2nd, the temperature was 101 Fah., and the pulse 140. The patient had a dusky anxious appearance and there was great tenderness over the wound. Hot flannels were applied to the abdomen and in the afternoon the temperature was 98'8 Fah. and she looked well and felt better though the pulse was 140. The tongue was moist and furred, the localised pain had diminished and there were pains of no great severity periodically extending over the whole abdomen. She was ordered rest in bed and rectal alimentation; in the evening the pulse was 120 and the temperature 100'2 Fah.. On the morning of the 3rd Fab., the pulse was 140 and the temperature 99'6 Fah. and there was an area of dullness round the scar of the former incision. In the afternoon the scar bulged, the patient was put under chloroform and an incision made through the cicatrix. About two ounces of thick creamy pus were evacuated. The appendix was found to be the seat of a recent rupture. It was transfixed and ligatured near its base and removed. It was about two inches long and

its mucous membrane was swollen and congested. During the manipulation necessary for its removal a coil of small intestine from the general peritoneal cavity shot into the wound. It was covered with lymph, showing a spreading peritonitis which was now liable to become septic. A glass drainage tube was inserted and packed round with iodoform gauze. Two skin sutures were inserted to prevent gaping at the wound. Five grains of calomel were ordered to be given in two hours and followed by a seidlitz powder two hours later. In the evening the bowels had not moved, the pulse was 130, the temperature 100 Fah. and she felt fairly well. The bowels were moved twice during the night and flatus passed freely. Next day the temperature was 99 Fah. morning and evening and the pulse 120. She was slightly sick once and restless; the facial expression was anxious and appearance dusky. The wound was dressed in the evening. On the second day after the operation the temperature was normal and pulse 100. She was somewhat jaundiced but her general appearance had improved. On the third day the drainage tube was removed and the wound allowed to granulate up. Glycerine injections were given daily to move the bowels. On the sixteenth day, in spite of two rectal injections of glycerine, two enemata of soap and water and a teaspoonful of compound liquorice powder the bowels were not opened. Pills containing aloin gr.$\frac{1}{4}$, ext. Bellad.

and ext.nuc. vom. ana grs.$\frac{1}{8}$ were ordered to be taken three times a day. On the 23rd day after the operation the wound was healed and the bowels acted for the first time without the use of the glycering injection. The patient was allowed to get up.

Case X. N.M., age 19, single, a delicate anaemic girl, subject to "hysterical fits" was first seen on the 10th April 1895. It was on account of these fits mainly that medical advice was sought. They were occurring with greater frequency and she was losing flesh somewhat rapidly. She had frequent attacks of "spasms" and sickness and was very costive. No organic disease could be made out, and the indications for treatment were constipation dyspepsia and anaemia. She was given Blaud's pills,a bismuth, rhubarb and soda mixture and a morning aperient of sulphate of magnesia. During May, June and July, this line of treatment was continued with slight variations, cascara, belladonna, aloes and compound liquorice powder being used to relieve the constipation. Careful dieting was prescribed but was probably not carried out and the condition of the patient remained in statu quo. On August 7th she complained of pain in the right iliac fossa and on examination there was muscular rigidity over the appendix but no tumour to be made out. She winced and cried out when deep palpation was attempted. There was no fever, and a bi-man-

ual examination revealed nothing abnormal. A blister was applied and the pain relieved. The patient went out of town shortly afterwards, and was not seen again till October 23rd, 1895. During the interval she had frequent attacks of "spasms", and the pain in the right iliac fossa was almost constant but was worse after an attack of colic. The colic was usually accompanied by vomiting. The attacks were becoming more frequent and more severe, and she said she sometimes went for a fortnight without having her bowels moved. There was no dullness or tumour to be made out by palpation, though the patient had become much thinner. A bimanual examination revealed a swollen tender appendix. She was sick after food of any kind. The temperature was normal and the pulse 100. Rest in bed, blistering and liquid diet were then tried, the bowels being moved daily by injections of glycerine. Under this treatment the tenderness remained and the patient had two attacks of colic in six weeks, the temperature remaining normal throughout. The removal of the appendix was decided upon and 10 days after an attack of colic the operation was performed on Dec.1st 1895.

An oblique lateral incision was made over the appendix which was easily found, there being no adhesion whatever. It was five inches long and contained two elongated faecal concretions

feeling like short lengths of slate pencil. It was removed close to the caecum. There was no trace of old or recent peritonitis or peri-appendicular inflammation. The walls of the appendix itself were only slightly thickened. No drainage tube was used. The patient made a good recovery and was able to go about three weeks later.

She has had no return of the colicky pains which were undoubtedly due to the concretions setting up attacks of appendicular colic without causing any further inflammation. The general health has much improved, the constipation is less troublesome and the "hysterical fits" do not occur so frequently as before the operation.

In these cases we have a fairly accurate picture of the clinical symptoms and signs of the disease in its different varieties.

Taking these as examples I intend to touch on the clinical aspects presented by them.

AETIOLOGY: Talamon[1] attributes appendicular colic to the passage of a stercolith into the appendix and maintains that the majority of these stercoliths are formed in the large intestine, being rounded in form and not the shape of the cavity of the appendix. In case X the calculi were certainly not rounded in form and were of the shape of the lumen of the appendix; and other calculi I

have seen were certainly too large to have passed from the caecum and must have been slowly formed in the appendix itself. A muscular spasm of the appendix may occur as the result of a volvulus of the appendix which may be undone by the colic itself and the case terminate as one of appendicular colic only. It is the long freely movable appendix which is most liable to slough and produce the most rapidly fatal form of the disease from a non-adhesive and septic general peritonitis; and this is just the variety of appendix which would be most liable to volvulus.

Whether a calculus is present or not the pathological conditions following the colic are similar. There is an interference with the blood supply to the part and a lowering of its vitality, rendering it more liable to inflammation or ulceration and more susceptible to the attacks of micro-organisms which abound in this part of the alimentary canal. If the appendix does not rupture and allow its contents to escape into the surrounding peritoneum, its devitalised tissues will at least allow of the transit of micro-organisms which transform a simple adhesive peritonitis into a localised abscess or a general septic peritonitis.

Age and sex are the main factors to be noticed in the aetiology and are important factors to be considered in making a diagnosis.

The disease mainly affects young males, though this is not so noticeable in the simple less acute cases which affect male and female pretty nearly alike.

An association with rheumatism has been pointed out in some cases which appear to have improved under salicylates, but personally I have been unable to find any connection between the two. At present there appears to me to be too great a tendency to attribute anything and everything to rheumatism, and the fact that an improvement takes place under salicylates does not prove a rheumatic origin. My experience is that the family history is more frequently tubercular.

The fact that the appendix has a large amount of lymphoid tissue has been given as an explanation of the predisposition of youth to the disease, as it is in youth that this tissue is most liable to inflammation. This tissue is also very liable to strumous inflammation and may be affected by rheumatism as in cases of tonsillitis.

Constipation is a factor of considerable importance and exposure to cold is commonly an agent and probably acts by producing a catarrh of the intestine as would the presence of irritating particles in the alimentary canal.

The aetiological factors of importance in diagnosis are age, sex, constipation and the ingestion of some irritating article of diet.

SIGNS & SYMPTOMS: The acute spasmodic colicky pains of Appendicular Colic are present in all the varities of the disease and this is the usual mode of onset. The pain is widespread over the whole abdomen at first but if anything is more marked on the right than the left, and if localised at all may be referred to the umbilical region. When I have had the opportunity of taking the temperature during this stage I have found it elevated, a fact which is not in accordance with the views of Talamon,[3] but is of some importance in distinguishing between appendicular and intestinal colic. The patient usually vomits once or twice, the vomited matter being the contents of the stomach with or without an admixture of bile. The presence of this two or three degrees of fever has frequently been my only reason for characterising the case at this stage as one of appendicular and not intestinal colic, and of treating with opium and not calomel. If the pain be very severe the patient may be in a condition of shock with a subnormal temperature.

After ten or twelve hours of intermittent colic pains the pain comes to be localised in the right iliac region which is tender and resistent, the point of greatest tenderness being about the middle of a line between the right anterior superior iliac spine and the umbilicus - - Mc.Burney's point.

The bowels are usually constipated and it has been for the relief of this constipation in the majority of cases that I have been asked to see the patient, purgatives having been given without any effect. In Case IV I was called because of the presence of a tender swelling in the region.

The temperature usually falls to normal after the colic ceases, and may never rise again. If after the first four or five days there is a rise to 101 Fah or 102 Fah. in the evening, falling again to 99'5 Fah. or 101 Fah. next morning, in the presence of a tumour, I believe it indicates a formation of pus in a confined space, either in or around the appendix; otherwise I attach very little importance to the temperature. In Case VIII there was no rise of temperature at all. As a general rule it is pus under pressure which is accompanied by a rise of temperature and when free in the peritoneal cavity the temperature may be normal or subnormal.

Barling[4] says "In the differential diagnosis between appendicitis and such conditions as intestinal obstruction and renal colic, the presence of two or three degrees of fever would point strongly to the first mentioned condition." But in renal colic I have frequently registered temperatures of 103 Fah and 104 Fah, and in one case of gall-stone colic I registered a temperature of 106'5 Fah. during a severe rigor. This tempera-

ture fell to normal in six hours and the patient had a paralytic pseudo-typhlitis afterwards with a temperature of 101 Fah to 102 Fah. (The tumour was large, tender and tympanitic. It disappeared when the constipation was relieved. The pulse throughout was 80 and the facial expression good).

THE PULSE is what I have found of most value as regards diagnosis and prognosis in Appendicitis and in peritoneal inflammations generally. In Appendicitis it is practically always quickened, varying from 90 to 120 or even 150 beats per minute. If persistently above 120 it is a bad omen. In Case IX it was the only sign indicating danger during the relapse belying the improvements in the other signs. The only characteristic apart from its rapidity is that it is usually a soft pulse. "The small wiry hard pulse of peritonitis" does not occur in a septic peritonitis as far as my experience goes.

THE PRESENCE OF A TUMOUR is a sign of considerable importance, if present. I have never seen a tumour which could be formed by the distended appendix alone. In Case X it could be felt per rectum. The nature of the tumour depends to a certain extent on the rapidity of its appearance and the more quickly it appears the better is the prognosis, other things being equal. If it appears

rapidly after the colic it will probably be tympanitic, and is due to the paralytic distension of the caput caecum with gas. If it appears more gradually it is usually due to the matting together of the colon and coils of small intestine by adhesive peritonitis and it is somewhat resonant to percussion. Absolute dullness may be taken as an indication that pus has formed. In the rapidly perforating or gangrenous appendicitis it is conspicuous by its absence.

DISTENSION OF THE ABDOMEN and rigidity of its muscular walls may make it difficult to detect any definite tumour. This does not come on for three or four days and is, as a rule, an indication of peritonitis. If the distension is soft the prognosis is more favourable than if hard, but in Case XI (subsequently discribed) there was a hard distended abdomen and recovery without operation, and in Case VIII the distension was a soft one and there was a general septic peritonitis. If the distension is hard the intestine will usually be found adherent to the abdominal wall by peritonitis, and care must be taken not to open into the gut in operating.

The presence of a tumour may also be difficult to make out on account of the distended state of the bladder, and in some cases frequent micturition may be the chief symptom. A tumour in the

region of the appendix may only be discovered after the bladder has been emptied by a catheter, the abdominal pain having been attributed to the distended state of that organ. More commonly it is not a retention of urine but a suppression, what little is passed being concentrated, high-coloured and sometimes albuminous.

DELIRIUM may or may not be present and usually varies with the temperature. Delirium without a rise of temperature I have found of grave import in abdominal cases as a rule.

THE FACIES OF THE PATIENT is characteristic and is frequently more to be relied upon than any one sign or symptom. It is pinched and the expression is anxious. The eyes appear to have sunk more deeply into their sockets and are encircled with black; and the whole face becomes of a dusky, bluish appearance.

At first every movement is painful and the patient lies on his back with the thighs flexed, but afterwards he becomes restless. A dusky countenance, cold purple hands and feet, with rapid pulse and restlessness are indicative of approaching death.

THE DIAGNOSIS of simple appendicitis is usually easy. When the onset is sudden it has to be differentiated from intestinal colic, enteritis,

irritant poisoning, biliary and renal colic. In cases of enteritis and irritant poisoning the vomiting is more persistent and diarrhoea is present. In intestinal colic there is an absence of fever and the pulse is more frequently slow than fast. The localisation of the tenderness to Mc.Burney's point is fairly constant in appendicitis. In biliary colic there is frequently localised tenderness in a line drawn from the point of union of the ninth rib with its costal cartilage to the umbilicus at about the junction of its upper and middle third. The vomit is more bilious, the motions pale, and the complexion jaundiced. In renal colic the pain begins in the back generally, and when it does not shoot definitely towards the groin it is usually along a horizontal line through the umbilicus. When the onset is more insidious we have to differentiate between Typhoid fever, Pelvic suppuration and Psoas abscess. In these cases the history will usually help to clear the diagnosis and an examination per rectum or per vaginam be of great assistance in distinguishing a tubal abscess.

The diagnosis between typhoid fever and appencitis is by no means easy. In the former there is usually no tumour to be made out and the onset is insidious. The presence of diarrhoea would be in favour of a diagnosis of typhoid and when appendicitic begins insidiously there is usually a tumour.

A psoas abscess usually points lower in the

groin and is accompanied by signs of vertibral disease. In these cases if a positive diagnosis cannot be given at once the case can wait for a day or two when as a rule, the diagnosis is easily cleared up.

In acute perforative appendicitis the diagnosis has to be made between a ruptured tubal pregnancy or tubal abscess (when the history will be of primary importance), perforation of gastric ulcer or acute intestinal obstruction. In these cases if the symptoms are grave it is infinitely better to give the patient the benefit and open the abdomen in the middle line, above the umbilicus, if the history points to gastric ulcer, below it, if a history of pelvic symptoms. As in both acute intestinal obstruction and in appendicitis there is a history of chronic constipation, during the attack the constipation may be absolute, and ~~the~~ a tumour be present in the right iliac fossa, it may be quite impossible to say which condition exists. The main symptoms in acute obstruction and in perforation may be those of abdominal shock with collapse subnormal temperature, cold extremities, and dusky, cyanotic countenance, the abdomen being tense, hard and tender, though the patient may complain of no pain. In acute strangulation the abdomen is usually rigid and retracted, while in peritonitis from perforation it is distended; but without the history of a localised pain at the commencement the site of

the perforation cannot be diagnosed in the absence of a tumour. Case VIII well illustrates the difficulty.

The diagnosis of suppuration in a localised peritonitis is very important as regards treatment, the presence of an evening rise and morning fall of temperature is the most reliable diagnostic sign and with this there is usually a marked increase in the size of the tumour. The presence of a rigor does not indicate pus formation. There may be an initial rigor in cases in which no pus is formed and there may be no rigor in cases in which pus is evacuated.

The occurrence of perforation in cases with a localised peritonitis is usually marked by a sudden aggravation of the symptoms and indications of a rapidly spreading peritonitis.

After the first three or four days the symptoms of appendicitis, if progressive, are those of peritonitis, and the diagnosis and prognosis must depend on the signs of the peritonitic conditions present and are more easily discussed in considering the treatment.

THE TREATMENT OF APPENDICITIS is divided into medical and surgical, and the crucial point lies in determining when medical treatment must end and surgical begin.

As the condition is generally considered to be a bilious attack, indigestion, colic or "spasms" the treatment is usually begun before the practitioner is called in at all, and it is the pain or constipation continuing in spite of purgatives, or the "spasms" not yielding to peppermint and pouticing which cause him to be sent for. To be called in during this stage of colic is exceptional unless it should be very severe or unusually prolonged.

Medical opinion is at present very much divided as to whether a purgative or opium should be given. I have never had an opportunity of treating a case in which a purgative of some sort has not already been given, and have always followed Dr. Wilk's dictum that the very fact of the doctor being sent for is an indication that a purgative should not be given. The one exception to this rule - intestinal colic - which is most quickly relieved by a brisk purgative, is always a difficulty. Intestinal colic is by no means easily distinguished from cases of acute intestinal obstruction or appendicular colic, in the absence of localised tenderness.

In Case I, we have the usual history of intestinal colic the attack having come on two hours after eating raw apples, and in Case II, after a

heavy supper in which roasted cheese was included. In both cases there is an absence of the rapid pulse usually met with in appendicitis. In the one case the presence of a localised tenderness was the only indication for a diagnosis of appendicitis, and in the other there was no such tenderness, so I considered the case one of intestinal colic simply. If there is any condition of shock present, I believe in treating the case as one of the more grave abdominal conditions, of which colic is merely a symptom.

The treatment then becomes symptomatic, and as any case may pass from a mild condition to a very severe one it must be treated as potentially a severe one from the first. With this in view, the patient must be kept at rest in bed, not being allowed to get up for any purpose whatever. Poultices applied to the abdomen relieve the pain and deplete the intestinal circulation by drawing blood to the skin. They are also very useful in allaying sickness, should that be present to any marked extent. Eight or ten hours total abstinence from food will also tend to give rest to the bowels, after that period only liquid food should be given and that in small quantities frequently. Peptonised milk I have found most serviceable as a whole, being readily absorbed, though it tends to increase the constipation and the formation of firm stools.

Beef-tea and peptones have not such a constipating tendency and may be added but I prefer keeping the patient on peptonised milk alone at first. Of local measures for the relief of pain I have found leeches applied over the appendix to give the most satisfactory results, and keeping in view the possibility of an operation in this locality, think it better not to apply more than three and to keep up the haemorrhage afterwards by poulticing.

The use of opium has been a much discussed subject. It eases the pain and makes the patient feel better, thereby misguiding the attendant, who is led to think there is an improvement while in reality things are going from bad to worse, until he wakes to the necessity of operating when it is too late to reasonably expect the operation to be of much effect. Personally I think too much has been made of this disguising of the symptoms. The urgent necessity for operation in appendicitis is an acute perforation or gangrene of the appendix with general septic peritonitis, and this is the very class of case in which pain is by no means a prominent symptom, even when no opiate has been given. Half an hour before death from septic peritonitis, the patient may feel well and be in no pain, when no opium has been given at all. In Case II, chlorodyne was given before seeing the patient, and in Case I no opiate was required throughout.

I believe one may safely give one or two doses

of opium in all cases. It diminishes peristalsis, thus allaying intestinal spasms and enabling one to make out any area of localised tenderness; the muscular rigidity becomes relaxed and the presence of a tumour may be more readily made out. In the presence of shock this is diminished and the small fluttering pulse becomes larger and steady, while the sub-normal temperature may rise to normal or 1 or 2 degrees above it. Unless a very large dose has been given, the localised tenderness to touch is not diminished by the use of opium, but is more readily made out in the absence of the general paroxysmal pains.

When the muscular spasm is relaxed by the opium, it is well to have the constipation generally present relieved. For this purpose I prefer to give an enema as less likely to do harm or set up the paroxysmal pain. If the constipation is of more than two days duration I prefer the injection of olive oil, followed after two or three hours with one of soap and water, but more frequently soap and water alone is sufficient.

Under such treatment the symptoms become moderated in the vast majority of cases and no other treatment is required. In Case I, no medical treatment was required other than the castor oil given before I saw the patient, a treatment quite as likely to do harm by stirring up violent peri-

stalsis and preventing the rest to the bowel which is the main factor in the cure of the condition and the prevention of unfortunate progression of the disease.

In these two cases the bowels were readily moved, a fact which may be regarded as a favourable element in prognosis.

In Case II the pain continued to be somewhat acute after the effects of the first opiate had passed off, and the question of continuing the use of the drug had to be faced. I believe this may safely be done in the presence of a tumour, not absolutely dull on percussion, and the absence of a rapid pulse, the temperature being normal or elevated, if not of a suppurative type. The indications for not using it being a sudden increase in the size of the tumour, a rapid pulse, and typhoid character of the temperature chart. In this case these were awanting and the patient continued to have half a grain of opium every four hours till the tenth day, the bowels being moved by enemata every second day after the fourth. The tunour remained stationary till the sixth day, then gradually disappeared, there being neither tenderness nor tumour by the tenth day, when in spite of the opium the bowels were moved without an enema being given. The tongue gradually becoming clean, the patient was allowed up on the fourteenth day.

Should the symptoms not show some ameliora-

tion under this treatment, the case will, in all probability, pass on to one with pus formation, and the difficulty of diagnosing the presence of pus has to be faced.

If we wait till the skin over the tumour becomes red and oedematous and the sense of fluctuation can be elicited, we have allowed the patient to run great risk of a general septic peritonitis. The cases in which there is pus formation without rupture of the appendix, are at least without a faecal or other concretion being found in the pus, are frequently cases with a mild insidious onset; or cases, similar to those just described, but in which the symptoms remain somewhat more acute. The indications of pus formation are practically those I have mentioned as indicating the further employment of opium to be of doubtful service, namely, increase in the size of the tumour, typhoid temperature with night sweats, and an increase in the pulse rate. Along with these there may be a renewal of the vomiting, the tongue instead of clearing becomes more coated, or the coating may become dark brown in colour, and the teeth coated with sordes. The presence of a rigor may be of some importance and if the tumour is not absolutely dull it may become so now. We may have reason to believe that pus has formed when the case is first seen, and yet under rest and dieting, the case will recover without

operation. The following is an example which well illustrates the value of rest and diet.

Case XI. A.B., age 21 years, a labourer. Family history good, and the patient has never been under medical treatment except as a child with the usual children's diseases.

On the 17th Dec. 1895, he felt pain in the right iliac region, but was able to continue his work till the 24th, when he had a "shivering fit" in the forenoon and was sick. He had vomited twice during the previous evening and the bowels were moved on the 22nd, the 23rd and the evening of the 24th.

When first seen on the 25th the temperature was 103'5 Fah., and the pulse 120. The abdomen was distended, very hard and tympanitic, and there was extreme tenderness over the region of the appendix. With rest in bed and milk diet the temperature and pulse came down gradually and steadily till the 28th Dec., when the pulse was 72 and the temperature 99 Fah.. The tenderness was then limited to an area about the size of a five shilling piece round Mc.Burney's point. He lay with the right thigh flexed; four days later he was able to be up and the bowels moved for the first time since the 24th Dec.

Here we have on the 9th day after an insidious onset a rigor with rise of temperature and

acute symptoms suggesting the addition of a rapidly spreading peritonitis, the symptoms abating without the use of drugs. On the 16th day the patient was up and there was no trace of a tumour. There was no pus passed in the urine or by the bowel and the conclusion is that none was formed. The presence of a rigor, even in the course of an appendicitis, is therefore no true sign of pus formation. In this case the temperature was not hectic and gradually came down after the rigor, the pulse becoming slower, though the tympanitis remained for four or five days.

In Case IV, we have the typical formation of pus in a case in which rest and medical treatment have been unable to cause an improvement in the symptoms. We have the hectic temperature chart, a rapid increase in the size of the tumour but no rigor. Here we have also the presence of a rash which may be taken as an indication of septic mischief of a mild type, though various other causes have been assigned for it. Such rashes frequently occur in abdominal surgery and have been accounted for on various hypotheses. Some attribute them to the action of drugs, such as belladonna or turpentine ; others to absorption of ptomaines and decomposition products from the alimentary canal under the use of enemata; and others to a nervous origin. They occur when neither belladonna nor turpentine has been given, as in the two cases here mentioned.

They occasionally, though rarely, occur in the presence of a septic diarrhoea; and the distribution is somewhat general and not along the lines of the nerves. When one patient in a ward gets such a rash, several others usually become affected, and the rash may affect patients consecutively occupying the same bed in a hospital ward.[5] This tends to show that they are of septic origin, though it may be the only septic symptom present.

These rashes do not usually occur before operation and have no grave significance afterwards though the intense itching may make the patient restless and cause him considerable discomfort. They may resemble urticaria or the rash of scarlet fever or measles, or be papular or a mixture of all these types.

From the long persistence of the tumour in this case there was every reason to expect that the wall of the abscess would be matted to the anterior parietal peritoneum, but such was not the case. The anterior peritoneum was free and the abscess was found in the matter coils of intestine and had to be entered through the general peritoneal cavity.

The natural cure in cases with abscess formation is by the pus making an exit for itself either by perforation through the anterior abdominal wall or into the bowel, rectum, bladder or vagina;

but it may perforate into the general peritoneal cavity with rapidly fatal results. The localised peritonitis may spread rapidly, the whole abdominal viscera being matted together, and the adhesions form loculi containing serum or pus. In Case VI this was the condition found. In the middle line near the umbilicus serum was evacuated. Towards the pubis there was a collection of creamy pus and over the appendix it was curdy and with a very faecal odour. The onset was very insidious and the characters of the fluids found led one to the appendix as the seat of the mischief. It could be felt irregularly thickened at the operation.

Apart from these results the pus may spread in the extra-peritoneal tissue, setting up an extensive cellulitis; be evacuated in the lumbar region or the groin; or may pass down the thigh below Poupart's ligament.

Case V belongs to the other clinical variety in which pus forms in a localised peritonitis practically from the commencement, due to an early perforation of the appendix. Such cases generally begin with very severe appendicular colic, quickly followed by extreme pain and tenderness over the appendix. The symptoms of shock are not marked, the pulse rate increases rapidly to 120 or more per minute, the temperature rapidly rising three or four degrees. The sickness is more persistent, the

tongue becomes coated and the face dusky, and the extremities cold. The tenderness over the appendix may be so great that palpation or percussion is impossible, or the muscles may be so rigid that dullness is of little value. When this condition is present the patient requires to be watched very carefully, and if there is no improvement in the condition in from six to twenty-four hours, according to the severity of the case, the question of operation must be entertained without delay. The chief improvements to be looked for are an improvement in the facial expression, and the slowing of the pulse. A diminuation in the fever, or increased feeling of well-being on the part of the patient is not of the slightest importance. In the absence of all other symptoms an unaccountably rapid pulse in a history of appendicular colic may be the only indication calling for early operative interference. If with a pulse increasing in rapidity, the temperature is falling or sub-normal, the prognosis is very grave.

A GENERAL SEPTIC PERITONITIS may occur in the course of appendicitis at any time or may be present when the case is first seen.

The clinical characters of this form of peritonitis of importance in diagnosis and prognosis are

VOMITING, persistent, sometimes without

nausea and quite apart from the ingestion of food, the vomit being at first bile, yellow, then green, passing on to a dark brown like the vomit in gastric haemorrhage, and finally becoming black; The darker the vomit, the graver the prognosis.

CONSTIPATION is absolute. The prognosis becomes more favourable if the bowels move.

THE ABDOMEN IS DISTENDED with flatus and typanitic. There is no peristaltit movement to be seen. If the distension is hard the prognosis is grave, but more favourable if it is soft.

THE PULSE is generally slow at first, if there is a condition of shock present, as when the origin of the peritonitis is rupture of a hollow viscus, but it gradually becomes more and more rapid. In the more acute cases, it is usually soft, and is of grave prognostic import if over 130 and with the rapid pulse, the temperature is coming down, or is already sub-normal.

THE TEMPERATURE may be anything from 96'5 Fah. to 106 Fah. and is of little significance, a matter of great comfort in obstetric practice. Here, post-partum patients become alarmed if the temperature is taken and I have registered high temperatures during the formation of a mammary abscess, or before the appearance of urticaria as the result of some error in diet. I now rely upon the pulse and have never found it over 120 without

indicating some septic mischief in or around the uterus nor had any reason for alarm if it was below that rate.

Next to the pulse I rely on THE FACE OF THE PATIENT as being of the greatest diagnostic value. It is the abdominal face already described.

THE APPEARANCE OF THE TONGUE will vary in the earlier stages according to the vomit, being covered with a white coating which becomes bile stained. It then becomes dry, fissured and brown; sordes gather on the teeth and the appearance of the face and mouth become suggestive of typhus.

PAIN is not a marked feature. The pain may disappear on a localised abscess bursting into the general peritoneal cavity, but the tenderness usually remains and is more widespread.

In Case VIII the necessity for performing laparotomy was practically decided upon from the face alone and in Case IX the pulse was the main indication for operating, the other symptoms being conspicuous by their absence.

A patient having once had an attack of appendicitis is liable to have a return of the condition, either from the presence of a calculus, kink, adhesions or twists in the appendix, or the presence of inflammatory thickening blocking its lumen. Any recurrent attack may be either severe or mild and

earlier attacks give no indication of the character the later ones will assume. The attacks recur at varying intervals. Six or eight weeks prolonged rest with careful dieting and the use of intestinal antiseptics may effect a cure in such cases, but as this is very uncertain and tedious the cases frequently have to be treated surgically to prevent chronic invalidism.

THE OPERATIONS performed in the surgical treatment of appendicitis are

for localised abscess

for suppurative peritonitis

for the removal of the appendix in chronic relapsing appendicitis.

The opening of a localised abscess may be a simple matter. If the abscess point the treatment is to open it over the point indicated by the redness and oedema of the skin. As already shown this may vary according to the position of the pus and the direction in which it is spreading. It may be over the appendix, in the groin, above the iliac crest, or in the lumbar region. As the majority of such collections of pus will open through the abdominal wall and not into the general peritoneal cavity, in the less severe cases there is no urgency as to <u>when</u> the operation should be performed, but when the formation of pus has been diagnosed to exist, the sooner it is evacuated, the better.

Of this Treves[6] says "in the majority of cases the evidence will not be unequivocal before the fifth day. Should its presence be made clear before that period, it is obvious that surgical interference should not be delayed; and it must also be allowed that urgency of symptoms may justify an exploratory incision before the arbitrarily fixed time is reached".

The want of urgency in the symptoms led one to believe that by waiting in Case IV, one might be able to evacuate the pus without opening into the general peritoneal cavity, but this was not the case. The line of the incision in this case was also indicated by this belief, namely, "obliquely from above downwards and inwards, external to the deep epigastric artery, ending above and to the outer side of the middle of Poupart's ligament".[7] Treves indicates this as the most convenient incision when made so that its centre will cross the line from anterior superior iliac spine to the umbilicus, containing Mc.Burney's point, about $1\frac{1}{2}$ inches from the bony process.

In Case V the incision was in the same direction, but more internal. The deep epigastric artery was severed, but there is no difficulty in ligaturing it in this situation, and the risk of injuring it is no reason for not incising right over the seat of the abscess, if that can be defin-

itely made out. An anaesthetic having been given and the bladder emptied, the site of the incision will be easily decided upon, preference being given to an oblique incision over the most prominent part of the tumour. The incision should be a free one, and be made carefully through the abdominal wall as the deeper layers may be soft and oedematous in cases in which the abdominal wall forms part of the wall of the abscess. The coils of intestine may be adherent to the abdominal wall by peritonitis and care must be taken not to injure these. In order to avoid this it is better to dissect through adhesions very carefully and not to tear them. The adhesions to the parietal peritoneum should be preserved intact. If the pus is found under the abdominal wall, or without breaking down the adhesions to it, its evacuation is all that is required. The abscess cavity may be irrigated gently with an antiseptic solution, as Iodine water, but as a rule it is better to simply insert a drainage tube and partially close the wound with sutures. The operation is simply the draining of an abscess, and in attempting irrigation the general peritoneal cavity may be opened into and a septic peritonitis result. The pus should be examined for calculi, and the condition of the appendix made out, though as a rule, in acute cases it is better not to attempt its removal. Generally no harm results from leaving it, recurrence seldom occurring after operation,

but Case IX is one of the rare exceptions to this rule. If the general peritoneal cavity is opened into before the pus is reached, it may be protected by packing round with sponges or swabs before opening the abscess; or by stiching the parietal peritoneum to the wall of the abscess by a ring of sutures round any part that is pointing. On opening the abscess cavity, the pus should be quickly mopped up as it wells out, and the cavity well packed with iodoform gauze. The patient should be turned on his right side while the pus is escaping to allow of free drainage.

Should peritonitis be present at the time of operation it will be better to make a median incision as access may thus be more freely obtained to irrigate the peritoneum. The intestines may be bathed in pus, in which case the prognosis is practically hopeless. The pus may be contained in loculi, formed by adhesive peritonitis, matting the bowels together. The loculi should be broken down and the peritoneum well irrigated with sterilized water or mild antiseptic solution. A counter opening should be made in the region of the appendix and the appendix may be searched for and removed or the adhesions round it may be broken down and a drainage tube inserted here as well as through the median incision.

THE OPERATION FOR THE REMOVAL OF THE APPENDIX has to be considered when prolonged rest careful dieting, the repeated application of blisters, the use of antiseptic remedies and the careful regulation of the bowels do not lead to recovery; and in cases in which in spite of prolonged rest for six or eight weeks at a time there is a constant tendency to relapse. Treves[6] gives the following as the more important circumstances, the presence of one or other of which would justify an operation.

1st, The attacks being numerous,

2nd, Increasing frequency and severity of the attacks,

3rd, The last attack being so severe as to endanger the patient's life.

4th, The patient being reduced to a state of chronic invalidism and rendered unfit to follow any occupation,

5th, The persistence of certain local symptoms during the quiescence period, rendering the existence of pus in or around the appendix probable.

The same incision may be used as in the acute cases, or one about two or two and a half inches in length at right angles to and bisected by the line containing Mc.Burney's point. If possible, the position of the appendix should be made out

before operating, and a bi-manual examination with one finger in the rectum will sometimes be of great assistance in determining this, in these cases.

The great difficulty is to find the appendix among the adhesions which firmly mat it and the bowels and peritoneum together. The operation is generally performed in the quiescent period between the attacks, but in the absence of a tumour during the quiescent period, some surgeons prefer to wait and operate during an attack. If operating during an attack, the removal of the appendix may be done by transfixing it near its base with a needle containing a double ligature of stout silk, and ligaturing each half separately, then removing the portion beyond the ligature.

In operating in the quiescent period, it is well to try to cover the stump of the appendix by peritoneum, either by a fold from the caecum or the mesentery of the appendix, or by dissecting the peritoneum off the appendix itself and cutting through the muscular and mucous layers at a lower level as in a circular amputation. The muscular layer is then brought together by a row of continuous sutures and the peritoneum stitched over the top of it. In chronic relapsing cases the adhesions are frequently very dense and must be carefully dissected out or gently separated, care being taken not to injure the bowel. The appendix may be difficult

to find and when found very difficult to remove. The guide to it is by tracing downwards one of the longitudinal bands of the caecum. In Case X it was found easily, there being no adhesions, and removed without difficulty.

In the majority of cases no drainage tube will be required and the abdominal wound may be at once closed with sutures of silkworm gut. If there has been much manipulation of the gut, or the liklihood of the peritoneum being fouled, it is safer to drain; also if it has been found impossible to remove the appendix in its entirety. The mere opening of the peritoneum breaking down adhesions and drainage seems to have a beneficial effect in some cases, possibly by allowing the exposed surface to granulate over and the process to atrophy.

Next to the skillfully performed operation, the most important thing to insure success is very careful after treatment and nursing. This has often to be carried out under the most adverse conditions as in acute cases the necessity for operation is in itself sufficient reason why the patient should not run the risk of removal to hospital.

The patient having been placed comfortably in bed and packed round with warm bottles will probably quietly sleep off the effects of the

anaesthetic. This period will be prolonged much to the comfort of the patient if a morphia suppository has been introduced at the end of the operation. This may safely be done if the patient has not been overdosed with opium previous to the operation and if there has been no septic peritonitis or special risk of its occurrence.

The intense thirst which follows simply opening the peritoneum is generally the first thing to be complained of. By with-holding all fluids for at least twenty-four hours this is increased but it is savest not to gratify the longing for fluids. The tendency to sickness and the risks of peritonitis are diminished if nothing at all is given by the mouth for that length of time. The thirst may be diminished by washing out the mouth with warm water or by the injection of warm water into the rectum.

Pain is not usually severe and may be entirely absent. Its presence is of no prognostic value.

The pulse-rate and temperature generally come down by the second or third day, a rapid pulse on the third day being usually indicative of peritonitis.

If by the third day the appearance and expression of the patient have not improved, if the pulse remains rapid, the tongue coated, the facial

expression bad, and vomiting should set in now, there is probably a commencing peritonitis, the clinical features of which have been already described.

THE TREATMENT OF SEPTIC PERITONITIS consists in getting the bowels moved. For this reason it is infinitely better to avoid the use of opium as much as possible. Five grains of calomel should be given and followed by a saline apperient after two hours. If from the nature of the operation there is any likelihood of the occurrence of peritonitis I think it better to administer the calomel at once in order to get the bowels well moved, to prevent, if possible, this frequently fatal complication.

The peritoneum has in a great degree the capacity for the re-absorption of inflammatory material and by draining the portal system, this capacity for absorption is largely increased. In order to encourage the portal system to absorb such inflammatory products it is important that no fluids should be given by the mouth for the first few hours. For the same reason I should hesitate to use the injection of water into the rectum to appease the thirst as recommended by Mr.C.W.Cathcart in the Phonographic Record?

Besides acting by draining the portal system calomel appears to have some definite effect

on the inflammation either as an antiseptic or anti-phlogistic. After its administration a change for the better frequently takes place before the bowels have moved; even in puerpueral septic cases with incontrolable diarrhoea it has a beneficial effect. When the bowels have been moved pretty freely two or three times its administration may be continued in two grain doses combined with one grain of opium every four hours. I have found this old-fashioned combination of undoubted value in peritonitis, but have never given it before the bowels have been freely moved and have not found it have any well-marked constipating effect. If there be much difficulty in getting the bowels to act I have used salol in preference to calomel and opium.

If the calomel and saline draught are vomited, and the vomiting cannot be controlled by the application of a poultice over the stomach, an enema containing one or two teaspoonfuls of turpentine should be given. This has usually the effect of causing the passage of flatus if nothing more, and by relieving distension adds to the comfort of the patient.

The vomiting will usually cease when a motion of the bowels has been obtained. If not, calomel given in doses of one-sixth of a grain every twenty minutes frequently has this effect. If the vomit should become faecal in character in all probability there is some intestinal obstruction, not

due to the peritonitic paralysis of the gut.

Should no unfavourable system arise by the third day the patient may have some fish or light pudding and gradually get back to his usual diet. He should remain in bed for at least twenty-one days after the operation, and if the wound has not healed then, should remain in bed until it has closed, unless a sinus should be formed, which may take years to close up. The drainage tube should be very gradually shortened in order to allow the wound to granulate up from the bottom. When the patient gets up he should wear a pad or belt for some time to prevent the occurrence of a hernia at the site of the operation.

In treating the obstinate constipation which sometimes follows the operation for appendicitis, I have found the daily evacuation of the bowels by injections of glycerine of value, combined with the use of pills containing ext. belladon., gr.$\frac{1}{8}$, ext.nucis vom. gr.$\frac{1}{8}$, pulv.ipecac. gr.$\frac{1}{4}$, ext.aloes gr.2, to be taken three times a day. When the bowels have moved without the use of the glycerine the strength of the pill may be gradually diminished by dividing the mass used for twenty-four pills into thirty, and after another week into thirty-six, and so on.

P.T.O.

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5. Martin "On the After-Treatment of Cases of Abdominal Section" Page 48,
6. Treves "The Surgical Treatment of Perityphlitis" Page 46,
7. do. do. " 50,
8. do. do. " 55,
9. Phonographic Record, Feb.1895 " 59.
